

Air Quality & Water Quality

Yielding a return is the consideration that settles everything in this little town which seemed to you, just now, so attractive. The stranger arriving there, beguiled by the beauty of the cool, deep valleys on every side, imagines at first that the inhabitants are influenced by the idea of *beauty*; they are always talking about the beauty of their scenery: no one can deny that they make a great to-do about it; but this is because it attracts a certain number of visitors whose money goes to enrich the innkeepers, and thus, through the channel of the rate-collector, *yields a return to the town*.

*(The Red and The Black; Stendhal; 1829;
emphasis by the author)*

Introduction

Like the residents of Stendhal's fictional town, we have come to realize that there is a strong connection between the environment and our economy. The connection between clean air and clean water, the natural mountainous beauty of our surroundings, and our tourism industry is direct and simple. We are further coming to understand that our quality of life determines the strength of the other sectors of our economy as well, since many businesses today are able to locate where they choose and they are choosing to locate where there is a high quality of life.

Just as there is an economic rationale for being good stewards of our environment, there are

strong health-related reasons for protecting our air and water quality, our scenic vistas, and our forests and wildlife. Study after study indicates the importance of clean air and water to the direct health of our people; recent data indicates the clear connection between particulate matter in the air and a variety of pulmonary diseases. Stormwater and other sources of pollution can taint our drinking water and create serious health problems. One effect of stormwater, flooding, can directly jeopardize public safety.

Finally, there is what may be termed a “moral” component associated with environmental protection. Every major religion has established tenets relating to the stewardship we owe to the world in which we live. There is something about us as a human species that places an intrinsic value on our natural resources.

This section of ***Asheville City Development Plan 2025*** addresses air quality and water quality and what is necessary to protect and preserve them for our enjoyment, our health, and our economic prosperity – and for the enjoyment, health, and prosperity of future



generations. Air quality and water resources - our two most pressing environmental concerns - are discussed in considerable detail in this section.

Air Quality

Asheville has long been known for its exceptional scenic beauty with panoramic mountain vistas, abundant natural resources and varied recreational opportunities. The mountain landscape of verdant forests and clear running streams boasts one of the most diverse biotic communities in the world. People have been attracted to the area for generations, to escape the summer heat, to find relief from health problems and to enjoy the outdoors.

Asheville's exceptional quality of life has made it desirable as a unique and diverse place to live, work and play. But, the vitality of the community is directly related to the sustainable use and care of the natural resources on which the people, plants, and animals depend. Asheville is currently facing a serious air quality problem that threatens not only the resource base on which our communities rely, but also the natural heritage and quality of life that area

residents hold dear. Air pollution is not only affecting human and environmental health but the regional economy as well.

Recreation and tourism are mainstays of the local economy with cultural, heritage and nature-based tourism especially important to Asheville. Spectacular mountain views and clean air are the primary reasons visitors come to the area. But, over the years, the views have increasingly become obscured. The visibility impairment typically manifests itself as a uniform haze that reduces visibility in every direction. Visibility, especially in the summer months has continued to degrade since the 1940's. Since 1948, when the first reliable records of visibility were collected from regional airports, visual range has decreased in the Southern Appalachians from a distance of 93 miles to the current average of 22 miles.

"While making small conscientious adjustments in our lives because we are disturbed by ecological degeneration of our planet, we have somehow failed to notice that the largest edifice made by human beings - the city - is radically out of sync with healthy life systems on earth, and is functioning in nearly complete disregard of its long-term sustenance. Many of us believe something is very right about our life in our cities. We seem to be a sociable species and cities serve this sociability... now if only we can make cities fit gracefully into the world we share with all other natural creations."

*Sustainability and Cities, by Newman & Kenworthy (1999)
quoting Richard Register at the
First International Ecocity Conference*

"There is no question that air pollution is the biggest threat to Western North Carolina tourism."

Hugh Morton

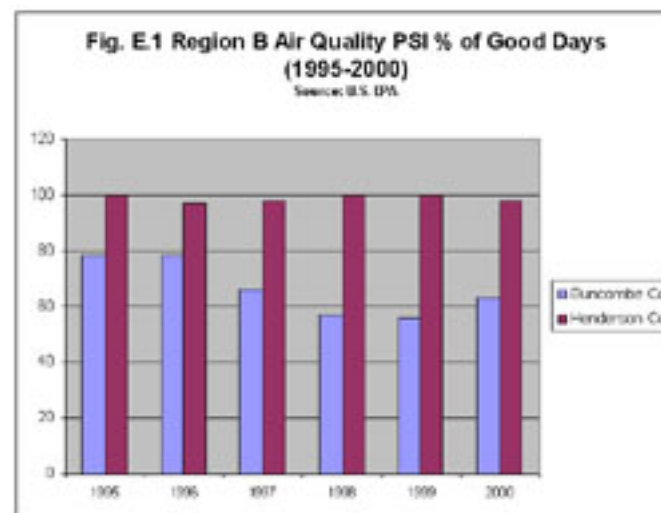


Air pollution can affect public health in many ways with both short-term and long-term effects. Certain segments of the population may be affected in different ways. For example, young children and elderly people are often more susceptible to the effects of air pollution. People with health problems such as asthma, heart and lung disease may also suffer more when the air is polluted. The extent to which an individual is harmed by air pollution usually depends on a combination of factors, including the duration of exposure, and the concentration of the chemicals. We need clean air so people can breathe without triggering asthma and other cardio-respiratory related illness.

Air pollution also has a detrimental effect on mountain ecosystems. Although most people are aware that air pollution can affect their health, it is also true that these same pollutants can adversely affect the growth and reproduction of the plants and trees that beautify our

We need clean air to sustain tourism and other aspects of the economy.

City and the surrounding mountains. Pollution can alter soil chemistry and create an unhealthy environment for plants. Air pollutants impact a wide variety of vegetation, including agricultural crops, landscape plants, forest and native vegetation. Plant life may become more susceptible to pests and disease and crop yields are reduced. Acid deposition in streams can lead to elevated levels of aluminum which is harmful to fish and other organisms. We need clean air to preserve our forests, streams and lakes for public recreation and wildlife. With the explosion of development in the Sunbelt over the past 25 years, the Southeast



has enjoyed a boom in economic prosperity. With this development and the subsequent increase in population comes an increased demand for transportation facilities, energy to operate our cars and our buildings and industry to meet our needs for more manufactured goods. Emission from cars, power plants and processing plants are contributing to poor air quality in the region and threaten to undermine a critical resource on which human health, the environment and our economy depend.

Geography and the prevailing wind pattern also play a role in the region's air quality. Prevailing winds in Asheville are predominantly from the north and northwest in both summer and winter, but southerly winds are also frequent. Many of the pollutants reaching the mountains are transported by the wind from other parts of the country. At the same time, much of the air pollutants come from local sources, especially on hazy, stagnant days. Additionally, the southeastern United States has more frequent episodes of air stagnation than most other areas of the country. The

mountains surrounding Asheville tend to restrict airflow and trap pollutants near the surface. Frequent calms and stagnating high pressure cells combined with the trapping effect of surrounding mountains, limit the

Pollutant	Effects	Source
Sulphur Dioxide contributes significantly to haziness. Sulfates also are the major cause of acid rain.	Aggravates lung diseases, especially bronchitis. Constricts breathing passages in asthmatics. Causes wheezing, shortness of breath, and coughing, especially when exercising. Long term exposure to both pollutants leads to higher rates of respiratory illness.	Power plants, large industrial facilities, diesel vehicles.
Nitrogen Dioxide combines with VOC's to form ozone.	Nose and throat irritation, especially in people with asthma. Increases susceptibility to respiratory infection.	Power plants, large industrial facilities and motor vehicles.
Ozone is a secondary pollutant.	Irritate lungs and breathing passages, causing chest pain, sore throats and coughing. Increases susceptibility to respiratory infections and reduces the ability to exercise. Effects are more severe in people with asthma and other respiratory ailments. Long-term exposure leads to scarring of lung tissue and lowered lung efficiency.	Ozone at ground level is formed through the interaction of nitrogen oxides and volatile organic compounds in the presence of sunlight.
Particulate Matter consists of solid particles of dust, smoke or ash.	Aggravate existing heart and lung diseases, changes the body's defenses against inhaled materials, and damages lung tissue. The elderly, children and those with chronic lung or heart disease are most sensitive.	Diesel cars, trucks and buses, power plants, industry and woodstoves, etc.

"Our citizens' health and livelihood and the health of our forests all depend upon clean air."

Senator John Edwards

capacity of Asheville to support a heavy burden of emissions.

During these calm periods, pollutants can remain over the mountains for several days at a time. The naturally high humidity of the area magnifies the haze generated by airborne particles. Distant views are obscured as well as the clarity of the landscape features. Colors appear washed out and much less vivid. Haze reduces visibility and is caused by the scattering of light when it encounters small particles in the air. This reduces the view of distant vistas and also the clarity and color of what we see. Sulfates in particular scatter more light, especially in humid conditions.

Scientific research and evaluation indicates that air pollution is not confined to state boundaries. Because air pollution travels across jurisdictional boundaries, any meaningful attempt to improve air quality must be addressed by a regional approach. Air quality is a shared resource, and all sectors of society bear a responsibility for improving air quality and protecting our natural resources. There are

many local and regional organizations working to address the issue. Several of these are described below.

Western North Carolina Regional Air Quality Agency

The Mission of the Western North Carolina Regional Air Quality Agency is to protect and monitor the area's air quality to safeguard the public health, safety, and to protect the environment. The goals of this Agency will be met by ensuring both public and private sources of air pollutants in Buncombe County operate within the constraints of local, state, and federal regulations. The Agency will conduct its mission in a manner that will seek to preserve the quality of life and the economic vitality of Buncombe County.

Land of Sky - Clean Air Campaign

The Clean Air Campaign works to reduce air pollution in Asheville, and the French Broad River Valley through increased public awareness and participation. The campaign is focused on educating the public about air quality problems, and what they can do to help solve



Decade-long Air Pollution Project to Release Findings This Summer

Recommendations from a 10-year project called the Southern Appalachian Mountains Initiative, or SAMI, are expected to be released this summer. The initiative examined where pollution is coming from and its effect on ecosystems in eight Southeastern states.

"We don't know yet what SAMI will recommend, but in terms of understanding the problem, we made great progress there. The results give us a much stronger understanding of what's going on," said Tom Elmore, director of the initiative. "The answers have been a long time coming, so I think people are starting to pay attention to the results."

Preliminary findings show that pollutants from Tennessee contribute to WNC's air pollution problem, and emissions from Georgia play a role when it comes to acid rain, according to Bill Jackson, U.S. Forest Service air resource specialist. But Jackson said models show North Carolina achieves the greatest benefit statewide by decreasing emissions inside North Carolina.

"The most important thing for us here in North Carolina is that we are our own worst polluter," said Michael Shore, Southeast air quality manager for the environmental group Environmental Defense.

The study predicted future emission levels if no action is taken other than regulations already on the way including the amendments to the Clean Air Act, according to Jackson. The research found, for example, that across all eight states, sulfur dioxide emissions would drop by 23 percent by the year 2010 without additional action. However, those projections assume aging power plants will be upgraded when they reach a certain age.

The study also predicts future emission levels if more stringent controls - controls that would use the most advanced technology available like scrubbers for power plants and zero-emission cars - are put in place. The results show that sulfur dioxide emissions could be reduced by as much as 86 percent with the most stringent strategies.

"The question becomes do we want to go further than we are now?" Jackson said.

The initiative research is not without criticism. Some worry the consensus nature of the work will lead to watered-down recommendations. At least one local doctor is also concerned there's been no focus on the health effects of air pollution, which some see as a major piece of the air quality puzzle.

"They are looking at barely the tip of the iceberg as far as the health," said Dr. Clay Ballantine, who treats heart and lung diseases at Mission St. Joseph's Health System in Asheville. "We know from dozens of studies that ozone drives asthmatics into the ER in hordes."

Ballantine said the research looked only at mortality and not at health costs associated with doctor visits, hospitalizations, lost work days and other medical expenses. He believes the health-related costs of air pollution will be grossly underestimated.

"The fear is that we could get watered down recommendations. But on the flip side, the hope is that if we can get all parties to agree to something, the recommendations will come to fruition," Shore said. "The air quality problem is one that we can absolutely solve if there's public demand and political will."

Asheville Citizen Times; Julie Ball; Jan. 20, 2002

Increasingly it is becoming apparent that for this state to remain strong economically we must take steps to ensure that our environment is protected. It is amazing to me that our air quality and water quality and quantity have declined to the extent that they have in this state and, yet, many in government, business and elsewhere are blind to the damage that is being done. We have real problems that are affecting our health and the health of our families. Many believe the increased incidence of pulmonary problems in Western North Carolina are a direct result of air pollution. Our water is at risk of becoming undrinkable and we are literally going to run out of water in part of the state if we don't act now.

*Thomas W. Ross; Z. Smith
Reynolds Foundation*

these problems.

Citizens for Safe Drinking Water and Air

Citizens for Safe Drinking Water and Air (CSDWA) is an association of citizens devoted to increasing and empowering citizen involvement in learning and making decisions about water and air in Asheville, Buncombe and Henderson counties in particular, but also in the context of our state and the USA. It favors and seeks regional cooperation and advocates vigorous enforcement of air quality standards and supports the work of the WNC Air Quality Agency and Board and the Regional Water Authority.

Southern Appalachian Mountains Initiative

In 1992, the Southern Appalachian Mountains Initiative (SAMI) was formed to study these challenging issues and “recommend reasonable measures to remedy existing and prevent future adverse effects from human-induced air pollution” on the forests, streams, and vistas of the Southern Appalachians, weighing the environmental and socio economic implications of any recommendations. SAMI is a

voluntary, consensus-based partnership of state and federal environmental agencies, federal land managers, industries, environmental groups, academia, and interested citizens.

Governors Summit

At the Third Annual Governors’ Summit on Mountain Air Quality, Governors Michael Easley of North Carolina, Roy Barnes of Georgia and Don Sundquist of Tennessee committed to work together to improve air quality in the mountains as well as in each of our states by signing the Southern Air Principles Agreement in recognition of the need to protect and improving air quality to safeguard public health, protect our natural resources and promote the long-term economic vitality of the South.

Key Provisions of the Southern Air Principles Agreement

- Each state must do its part to protect and improve air quality.
- Regional air quality problems must be addressed through regional approaches that

address each state's unique qualities and needs.

- The southern states must continue to work together to develop and implement new strategies that will improve regional air quality, such as multi-pollutant regulatory strategies for reducing nitrogen oxides, sulfur dioxide and mercury and innovative transportation and energy policies.

While a significant part of our local air quality problem results from pollution occurring in other areas, there is a great deal that we can do locally to improve our air quality situation. As the newspaper article excerpted below indicates, most of our pollution problems are created by local sources.

Generally speaking, movement toward a Smart Growth development pattern that is supported by a well-connected multi-modal transportation network and a "green building" program will be a strong step in the right direction. The City is also pursuing recycling, fleet conversion to alternative fuels, intelligent transportation systems, landscaping regulations, and other activities that will have an effect on improving air quality. Additionally, we need to join City of Asheville voices with those of others in the

region to lobby for appropriate state and federal legislation to address problems outside our immediate control. A more complete list of local activities to improve air quality is provided below.

Green Building

- Implement green building program.
- Develop energy-saving landscaping codes.
- Recognize projects that incorporate energy-saving or other ideas that help to improve air quality.
- Plant more trees on streets and in parking lots to help absorb pollutants and clean the air.

Smart Growth/ Land Use

- Promote Smart Growth concepts.
- Promote mixed use development.
- Promote redevelopment and infill development.
- Promote and implement a connected street pattern.
- Establish and maintain a healthy Downtown
- Increased density around urban centers.
- Increase residential density at mass transit nodes and closer to places of work and play.
- Design walkable communities to decrease car dependency.

Transportation Improvements

- Develop multi-modal transportation options (transit, bicycles and pedestrian).
- Design new roads and improve existing corridors utilizing access management principles to maximize traffic capacity and improve traffic flow.
- Construct sidewalks, greenways and bicycle paths/lanes.
- Promote multi-modal transportation opportunities.
- Design new roads and retrofit existing roads to accommodate multi-modal transportation.
- Synchronize traffic signals and implement intelligent transportation systems.
- Increase roadway connectivity.

- Provide mass transit alternatives.
- Improve mass transit operations so as to increase ridership.

Regional Efforts

- Coordinate with other agencies, other local governments, and State and federal agencies to develop and promote programs to improve air quality.
- Continue to support an independent local air quality board.
- Participate in an Early Action Compact to identify and implement regional air pollution reduction measures.

Regulatory Enhancement

- Support efforts to address the problem locally through such efforts as vehicle emissions testing.
- Lobby State and federal lawmakers for better air quality legislation and enforcement, such as the Clean Smokestacks Act.
- Continue to support local air quality enforcement efforts.

Alternative Fuels

- Convert City fleets to alternative fuels and consider all available or emerging clean air technologies for City operations.

City Committed to Use of Alternative Fuels

With its beautiful mountain vistas, unique architecture and reputation for healthful living, the community places a high priority on a clean environment. The City of Asheville and its partners are committed to leading the community in its quest for a clean environment and healthful living for its citizens and many visitors. The City believes that proactive, sensible leadership will pave the way for a new paradigm in energy and transportation. In response to the need to provide a leadership role in the community regarding responsible stewardship of the environment, the City of Asheville has joined with Mission St. Joseph's, Buncombe County, the Towns of Biltmore Forest and Woodfin, CP&L, WNC Regional Air Quality Agency, and the Chamber of Commerce to initiate an alternative fuel vehicle (AFV) program for their respective fleets.

Water Quality

Water is a valuable resource on which all life depends. Asheville has been blessed with an abundant water supply, receiving an average of 48 inches of rain per year. The availability of clean water for drinking, recreation and to support native ecosystems and industry contributes significantly to the high quality of life residents have come to expect. However, the growing population and subsequent urban development places a greater demand on our water resources, while at the same time creating more waste and pollution that, if not properly managed, could further degrade our water resources. To insure that water of adequate quantity and quality is available for future generations, careful planning and sound management are necessary.

Urban growth is both necessary and desirable, however we must ensure that the increased stormwater runoff from urban development is dealt with both in terms of quality and quantity. Water quantity refers to the volume and rate of runoff, while water quality deals with the characteristics of the water itself, regarding the health and safety for drinking, recre-

ation and the capacity to support life. Of course, the two are often interrelated as in the case of urban stormwater management where both quantity and quality issues come into play.

The management of urban watersheds has become increasingly complex in recent years. Urbanization, if not properly planned and managed can dramatically alter the natural hydrology of an area. Urban development results in an increase in the amount of land covered with impervious surfaces such as streets, parking lots, and rooftops. Increased impervious surface cover decreases the amount of rainwater that can natural infiltrate into the soil and increases the rate and volume of stormwater runoff. This leads to a number of problems that are outlined below.

- There is less opportunity for groundwater infiltration, consequently streams carry more stormwater and are more inclined to spill over their banks, causing local flooding.

"Urbanization has the highest impact on water quality of any other land use- more that farming, timber or industry. Somehow we've got to get across to people that what they put on their lawns, drains into the watershed. We don't think of rivers and waterways as starting in our backyards, or at the end of driveways and strip malls."

Can McNutt, Basin Planner, DENR Division of Water Quality

- Stream flow velocities increase, which accelerates stream bank erosion.
- Peak flow is higher, which also increases the incidence of flooding.
- Base flow is lower during dry weather, due to lack of infiltration.

In the urban watershed, as the natural drainage patterns are altered due to the concentration of paved surfaces, stormwater flows increase and there is a greater potential for more frequent flooding, even during minor rainfall events. In addition to downstream flooding, the increased streamflow due to the higher and more rapid peak discharge can lead to streambank erosion, and overloading of the stormwater drainage system. Flooding is costly to the community and damaging to private property and public infrastructure. Eroding streambanks clog channels, culverts and pipes and the sediment is washed into ponds and lakes further reducing their capacity to store water.

Various pervious paving techniques have been developed in order to mitigate the impacts of stormwater runoff. Water-pervious materials such as crushed gravel, grass pavers and pervi-

ous concrete can be used for driveways, parking areas, walkways, and patios to minimize runoff, and increase infiltration. Pervious materials allow water to enter the ground by virtue of their porous nature or through large spaces in the material. Although, the initial cost of pervious materials is somewhat greater than asphalt, from a holistic perspective greater savings are realized due to a reduction in construction costs for traditional stormwater control mechanisms. Land reserved for stormwater ponds can be better utilized for buildings, parking and landscaping. Energy costs for air conditioning may be reduced



Pervious pavement at an Asheville medical office.



beneficial to trees as the material allows water and air to reach tree roots.

Stormwater runoff has also been identified as a leading contributor to pollution of our waterways. Increased human activity in the watershed results in a concentration of various pollutants from driveways, lawns, construction sites, roadways and parking lots. Pollutants such as sediments, nutrients, bacteria, heavy metals, pesticides, oil and grease are washed off during precipitation events and pollute streams. These pollutants also can raise the temperature of water in the stream so that it no longer is hospitable as trout habitat and may also be detrimental to other aquatic wildlife.

Water quality can be affected by point and non-point source pollution. Nonpoint sources have diffuse places of origin such as lawns, parking lots, roads, abandoned land fills and agricultural fields. Point sources are associated with identifiable conveyance systems such as municipal storm sewers, pipes and industrial drainage channels.

Sediment is the largest single non-point source pollutant and the primary factor in the reduced

quality of surface waters. Most sediment is derived from the grading associated with the construction of roads and buildings, but can also be the result of streambed scouring due to increased velocity of stream flow. Dissolved sediment in the streams causes turbidity, which is detrimental to aquatic life. High turbidity also prevents aquatic plants from receiving the sunlight they need for survival. Sediment also lowers dissolved oxygen levels, literally choking our fish and other species. Asheville has a sediment control ordinance in place. However, especially in the mountains, the sediment control devices often do not confine all run-off to the project site even when properly installed.

Best Management Practices (BMP's) are recognized as being the "best" way to treat or eliminate pollutants in stormwater runoff. The applicable practice may vary based on site conditions and the given application. Some examples are:

- **Wet Ponds** - Wet ponds have been used to treat stormwater for years and were initially used to control the quantity of water and prevent flooding. Currently wet ponds are

"The landscape should belong to the people who see it all the time."

LeRoi Jones, Home, 1996

also designed to improve the quality of stormwater runoff.

The wet pond allows for sediment and polluting chemicals to settle out. These sediments can easily be removed by providing access to excavation equipment.

- **Stormwater Wetlands** - Constructed stormwater wetlands have become popular in urban environments. They are basically similar in design to a wet pond, only shallower so they have little capacity for flood control. Similar to the wet pond they also have an area where solids can settle out and easily be removed. The main body of the wetland consists of high and low areas, which encourage a variation in wetland vegetation. They are also designed in a sinuous fashion to maximize the flow path and increase detention time.
- **Bio-Retention and Rain Gardens** - The rain garden is becoming a popular BMP. Rain gardens detain water for a shorter length of time and thus can support a greater variety of plant material. Thus are

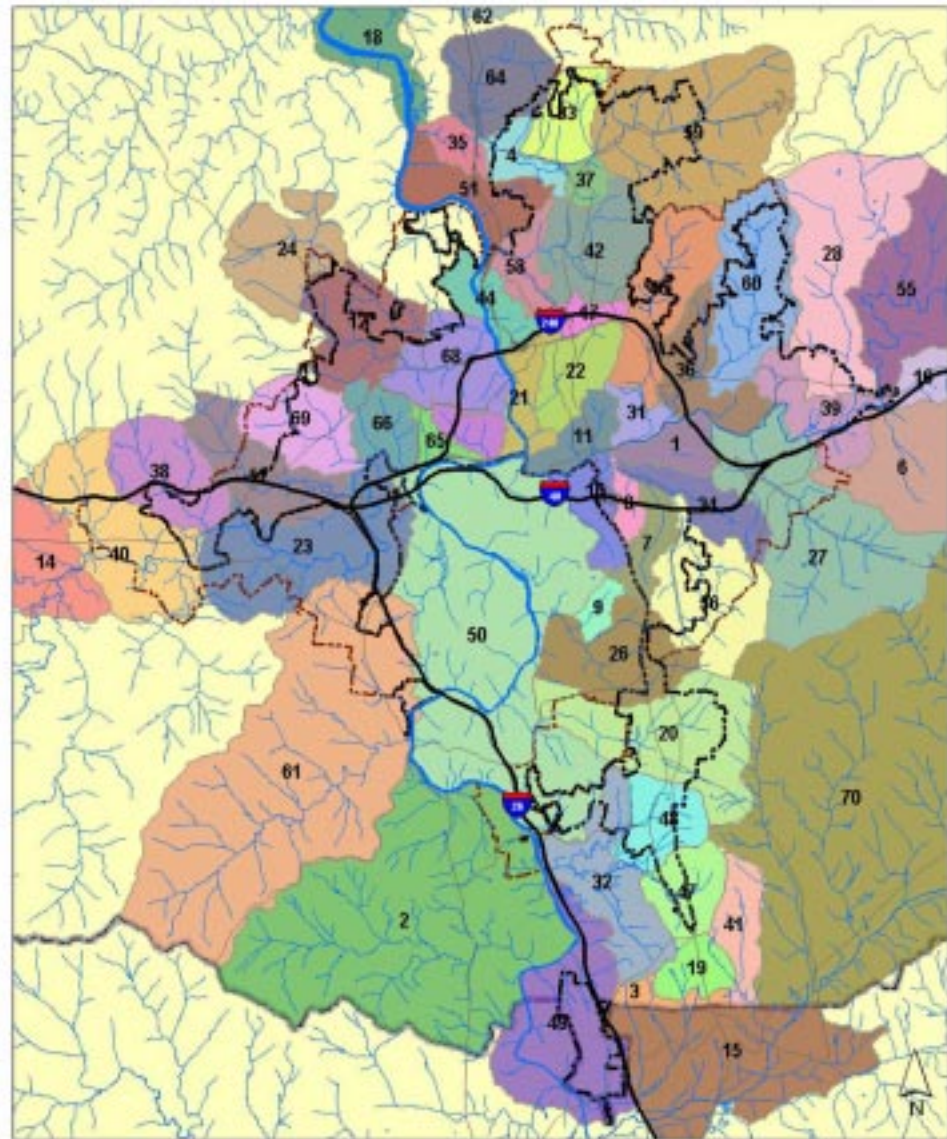
more attractive and consequently have received a greater degree of acceptance by the community. On the surface is a layer of loamy soil, suitable for plant material, but the key to the success of a rain garden is the surrounding soil. Sandy soils work best. Some soil types may require the addition of underground drains.

- **Riparian Buffers**- Riparian buffers are vegetated strips of land along streams and other waterways, planted with native trees, shrubs and grasses. The vegetation serves to filter pollutants before they enter the waterway. Riparian areas serve vital ecological functions for aquatic life. Vegetation stabilizes stream banks and provides food for aquatic species. Stream bank vegetation also moderates water temperatures and provides large woody material for stream structure and fish habitat. Buffers can also serve as travel corridors for wildlife, reduce the incidence of flooding and provide recreational opportunities. The graphic on the next page illustrates an ideal riparian buffer zone in both an urban and rural setting. A riparian buffer is a vegetated strip of land along a stream or waterway that protects

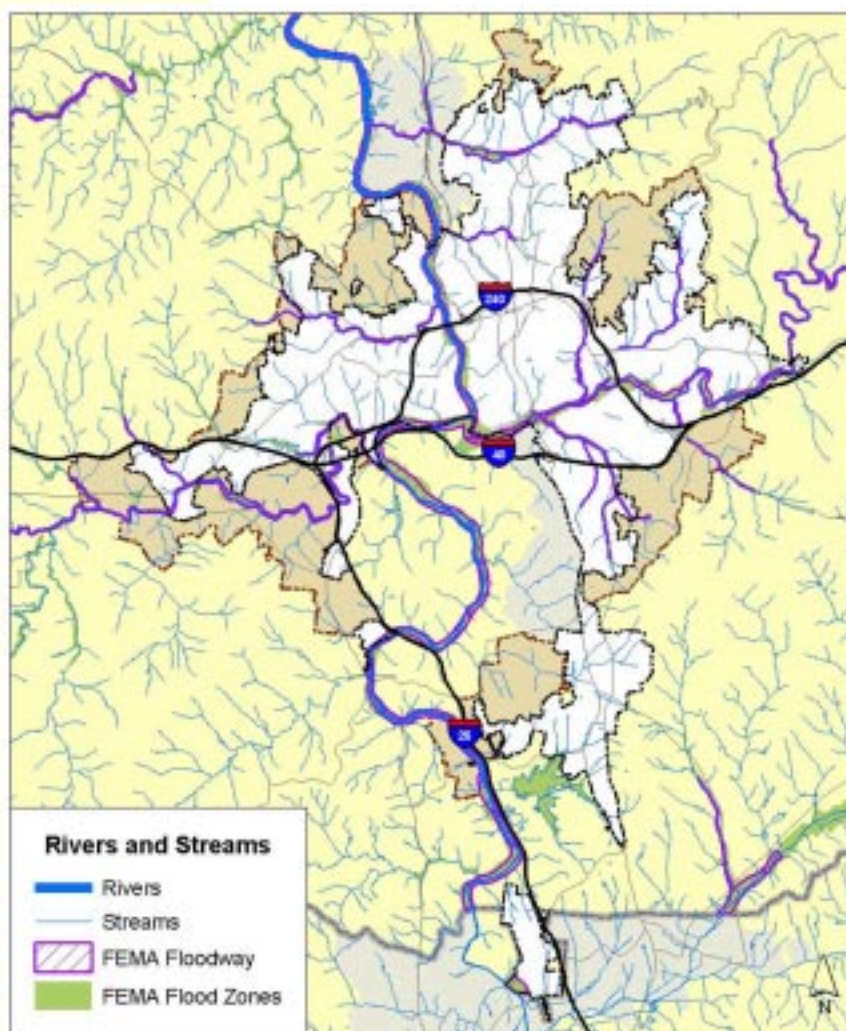


Drainage Basins

1 Alta Vista	36 Lower Hail Creek / Beverly Hills
2 Avery's Creek Sewer District	37 Montmon Ave / Grove Park
3 BC Drainage into COWSD	38 Moore Creek
4 Beaver Lake	39 Otter / Parkway Forest
5 Bee tree / New Salem Road	40 Pole Creek
6 Billy Graham "The Cove"	41 Powell Creek Watershed
7 Bitmore / Caribou Road	42 Reed Creek / Grove Park
8 Bitmore / London Road	43 Reems Creek
9 Bitmore Forest	44 Richmond Hill / Montford Hills
10 Bitmore Forest / Ram Branch	45 Ridgecrest
11 Bitmore Village	46 Ross Creek
12 Camelot / Echo Hills	47 Royal Pines
13 Camp Branch	48 Skyland
14 Candler Heights	49 South Bluncombe / Airport
15 Cane Creek Sewer District	50 South Bluncombe Interceptor
16 Christian Creek	51 South Woodfin
17 Civic Center / I-240	52 Starnes Cove
18 Craggy Prison	53 Swannanoa / Alexander Lateral
19 Crescent Hills / Oak Park	54 Swannanoa / VA Hospital
20 Dingle Creek	55 Swannanoa / Warren Wilson College
21 Downtown / Clingman Avenue	56 Sweeten Creek / Forest Lake
22 Downtown / Nasty Branch	57 Tomahawk Branch
23 Enka	58 UNCA / Lenox Park
24 Erwin Hills / Mt Carmel	59 Upper Beaverdam Creek
25 Flat Creek	60 Upper Hail Creek
26 Four Mile Creek	61 Verable / Bitmore Square Mall
27 Gashes Creek	62 Wagner Creek
28 Grassy Branch	63 Weaverville
29 Grovemont	64 Weaverville Hwy / Bard Cove Rd
30 Grovestone	65 West Asheville / Fairfax Avenue
31 Kaniworth	66 West Asheville / Horney Heights
32 Lake Julian	67 West Asheville / Moore Branch
33 Lakewood Park	68 West Asheville / Smith Mill Creek
34 Linwood Park / Bitmore Terrace	69 West Asheville / Sulphur Springs
35 Lower Beaverdam Creek	70 Case Creek



Map 16

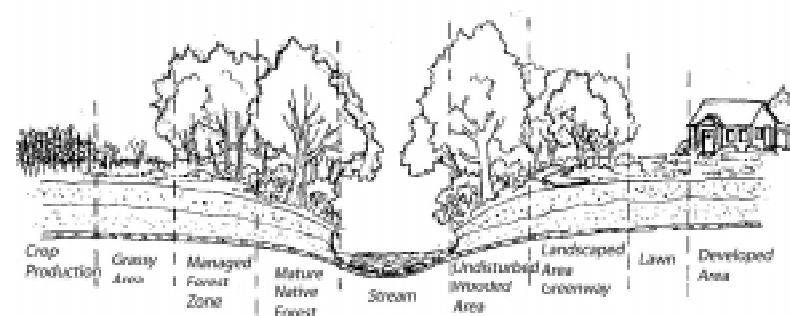


water quality, reduces erosion, provides wildlife habitat and provides recreational opportunities such as a greenway trail. The width of the buffer varies depending on the adjacent land use and the physical geography of the surrounding area. An effective buffer is usually at least 50 feet wide with a grassy filter strip separating the forested area from the land disturbing activity. See picture below.

Watersheds, riparian areas and stream habitats have been extensively altered by human activity in the Asheville area and throughout the southeast over the past 200 years. Scientists have begun implementing various wetland mitigation and stream restoration techniques.

Rural Setting

Urban Setting



Wetland and stream restoration is not an exact science but is an evolving art based on scientific theories and successful experiments. Ecological restoration is an attempt to reverse unsustainable development trends. These techniques should be considered for Asheville area streams and wetlands.

Clean Water Act

The Clean Water Act (CWA) of 1972 and subsequent amendments provide the legal framework for the protection of water resources. The objective of the Act is to restore and maintain the chemical, physical and biological integrity of the nation's waters. Under the Clean Water Act, the discharge of pollutants into waterbodies is regulated and limited through the National Pollutant Discharge and Elimination System (NPDES). Nonpoint source pollution is controlled through the development and implementation of Best Management Practices.

Since the passage of the Clean Water Act, the quality of our waters has improved dramatically. Despite this progress, however, there are still improvements to be made. There are still

a significant number of impaired streams in the state. A leading source of this impairment is generated from polluted stormwater runoff. Phase I of the Environmental Protection Agency's (EPA) stormwater program was promulgated in 1990 under the CWA. Phase I relies on the NPDES permit system to address stormwater from medium and large municipal storm systems.

The Stormwater Phase II program is the next step in the EPA's effort to protect the nation's waterways. The Phase II program extends coverage of the NPDES stormwater rules to certain "small municipal storm sewers and takes a slightly different approach with development and implementation of the program. The City of Asheville has been designated under the Phase II program and has already taken some proactive measures towards implementation such as having an Ordinance in place that requires control for the 10 year storm event. The City Engineering Department has also mapped all outfalls utilizing a Geographic Information System.

"... Asheville is so lucky to have two rivers that run right through the middle of the City. You always think about the mountains but you don't have mountains without rivers."

Karen Cragnolin; Executive Director, RiverLink

Water Supply

According to rainfall numbers collected at the USDA Forest Service's Coweeta

Hydrological Lab in

Otto, Western North Carolina is in the midst of a drought that began in 1998. Many residents remember the dry weather that sparked mandatory water restrictions back in 1998. Residents couldn't water lawns or wash cars. Only essential water use was allowed. The restrictions ended when reservoirs refilled, but

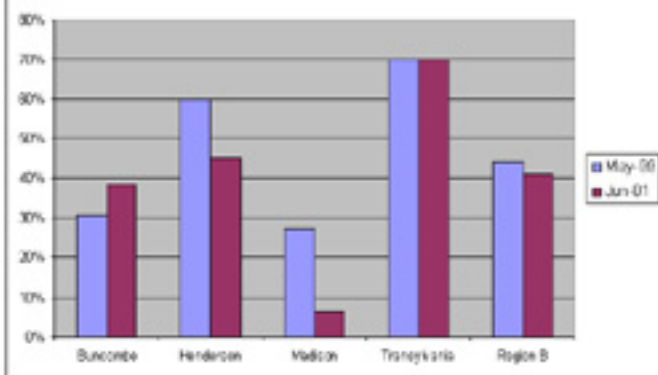
the area never really got out of the dry pattern. WNC remains in a long-term drought, according to area meteorologists. The drought has also caused significant damage to our urban forests, allowing them to be more susceptible to insects and disease. Not only has the drought caused crops

and lawns to suffer, it has also drained small streams endangering the fish and wildlife that live there. Eventually rainfall will increase and the drought will subside, but in the meantime conservation measures should be practiced.

Our primary source of water is located in Black Mountain in eastern Buncombe County where the water flows from pure mountain springs and streams into a lake known as the North Fork Reservoir. This pristine lake is surrounded by 20,000 acres of highly protected mountain forests owned by the City of Asheville. This preserved land is nature's perfect water filter. The water is so pure that very little treatment is required. Our newest source of water is the Mills River, which was brought on-line in late 1999 and will ensure that residents of this region continue to enjoy exceptionally high quality drinking water well into the 21st century. The Mills River Watershed is very different from our watershed in the east; however, it still provides an excellent source of water. The watershed covers 47,440 acres in Henderson and Transylvania counties, with approximately 75 percent of it being in the Pisgah National Forest. It is a mixture of forest, farmland, and low-density development. This mixture of

Fig. E.2 Region B Water Quality % of Stream Sites Rated Excellent or Good 1999-2001

Source: UNCA Environmental Quality Institute Technical Report #01-004, 1999 WNR
Report Stream Rankings



forest and low-density development accounts for the excellent water quality in the Mills River. Although the Mills River is not pristine, it has the advantage of providing our region with a natural resource that has multiple uses, including being an invaluable drinking water source, trout fishery, fish and wildlife habitat, and recreational resource.

The City of Asheville coordinates with a number of local organizations in an effort to improve water quality. Some of those programs are outlined below.

RiverLink

RiverLink is an Asheville based regional, non-profit organization that is leading the economic and environmental revitalization of the French Broad River and its tributaries as a place to live, work and play. RiverLink is interested in promoting growth in an environmentally sustainable fashion and has been involved with various water quality initiatives along the French Broad River and its tributaries.

For example, Riverlink is coordinating North

Carolina's first cost share urban watershed improvement program in the Swannanoa Valley. The program is designed to make improvements to property that will enhance water quality in the watershed. The Swannanoa watershed project will also demonstrate innovative methods of urban stormwater treatment for regional and state-wide reference.

Land of Sky Regional Council

The City has also been working with the Land of Sky Regional Council to address water quality concerns for the Ross Creek Watershed, most of which falls within the City of Asheville. The Regional Council prepared a restoration strategy for the watershed. The watershed was chosen because of its urban character and the fact that it has been designated by the Environmental Protection Agency as an impaired waterway. The watershed restoration strategy will include site-specific designs for one or more demonstration projects. Dependent on the site, the demonstration projects might illustrate stream bank stabilization and/or stormwater management techniques.



Air Quality Goals and Strategies

Goal I. Promote and implement a Smart Growth development pattern.

Goal II. Promote a well-connected multi-modal transportation network that utilizes best available technology for operational effectiveness.

Goal III. Implement an effective “green building” program.

Goal IV. Support regional efforts and state and federal regulatory actions to continually improve air quality.

Strategies

1. Coordinate with other agencies, other local governments, and State and federal agencies to develop and promote programs to improve air quality.
2. Continue to support an independent local air quality board.
3. Support efforts to address the problem locally through such efforts as vehicle emis-

sions testing and the use of zero emissions vehicles.

4. Organize to effectively lobby State and federal lawmakers for better air quality legislation and enforcement such as the Clean Smokestacks Act.
5. Participate in an Early Action Compact to identify and implement regional air pollution measures in a manner consistent with relative City impacts on air quality and the City’s ability to pay for air quality enhancements.

Goal V. Continue and enhance City programs that promote improve air quality.

Strategies

1. Work to convert City fleets to alternative fuels and consider all available or emerging clean air technologies for City operations.
2. Continue the innovative and highly effective City recycling program.
3. Work toward enhancing City landscaping regulations.



4. Implement intelligent transportation systems on City streets and state roads.

5. Consider development of a municipal renewable energy program.

Water Quality Goals and Strategies

Goal I. Continue to coordinate with and support efforts by RiverLink, Land of Sky Regional Council, and state and federal agencies to improve water quality.

Goal II. Implement stormwater management practices mandated by federal laws in an effective and timely fashion.

Goal III. Develop and use best management practices to address the effect of development on stormwater runoff and water quality.

Strategies

1. Develop and implement drainage basin level stormwater management and erosion control plans in cooperation with private prop-

erty owners, regional agencies, state and federal agencies.

2. Encourage the preservation of riparian zones through reclamation of developed properties in these areas to a more natural state.

3. Encourage the use native plants to reduce non-source point pollution from lawns and minimize water usage during periods of drought.

4. Reduce impervious surfaces by minimizing parking requirements.

5. Require landscape retrofitting of existing parking lots to reduce impervious surface and stormwater runoff.

6. Encourage the use of conservation easements to preserve riparian areas.

7. Develop appropriate riparian buffer requirements, as needed, to enhance the environmental function of streams, creeks and rivers.